



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent application of:)	Before the Examiner
)	Arthur L. Corbin
Emmanouil Domazakis)	
)	Group Art Unit 1761
Serial No. 10/031,089)	
)	
Filed: January 15, 2002)	
)	
METHOD OF PRODUCTION OF A)	
MEAT PRODUCT CONTAINING)	
OLIVE OIL)	

RULE 1.132 DECLARATION

I, Emmanouil Domazakis, do hereby declare that I am the inventor of the invention disclosed and claimed in the above-referenced patent application. I have reviewed the final Office Action mailed January 19, 2005, from the United States Patent and Trademark Office in this matter, and the patent references cited therein. I provide the following remarks in response to issues raised by the Examiner in the Office Action.

In the 7th paragraph of the final Office Action, the Examiner's comment is that our previous arguments are not persuasive (Applicant's argument....e.g. reduction of heart disease). My response is as follows:

1. The beneficial effects of some of the ingredients of olive oil are known and accepted worldwide. However, the functional substances of olive oil, such as the antioxidants polyphenols and tocopherols, should remain effective even after the production process. Thus, one of the aims of the invention was to reduce the possibility of losing or destroying the functional characteristics of antioxidants and of the other

beneficial substances of olive oil. For this reason, I used milder processing conditions to incorporate the olive oil than those used in the method of Dubanchet et al.

The latter method aims at the transformation of the liquid olive oil in a solid mass, thus emulsification of olive oil (column 1, lines 52 – 56). The outcome of this procedure (column 2, lines 14-38) is a solid and thermally processed emulsion of olive oil and milk proteins (a fat replacer preparation).

Said solid mass of fat preparation is used to replace pork lard (traditionally used), by mixing it into the batter in the traditional way (column 2, lines 39-46), for making products mentioned in the second group (column 1, lines 24-26).

Contrary to the Dubanchet method, the present invention allows the making of meat products with olive oil incorporation, by a direct addition of olive oil into the meat batter (meat matrix). My approach avoids the stressful to olive oil thermal processing step (see Dubanchet column 2, lines 21-22). Instead, olive oil (liquid) is being added into the meat batter at a temperature of 4°C (maximum), thus protecting the sensitive nutritional ingredients (antioxidants, unsaturated fatty acids). For additional protection against the detrimental oxidative effect of oxygen, the greatest part of our process takes place under a vacuum of 1000mbar.

The processing method of the present invention is substantially and essentially different from that of Dubanchet by the fact that the olive oil used, and especially the olive oil globules are formed and trapped in the meat matrix in a direct way.

To achieve a proper stability in the meat matrix and to prevent separation of the olive oil and water during cooking, the olive oil globules must be finely dispersed within the matrix of meat proteins. Comminuted “emulsion type “ (our case) meat products

may be described as a complex mixture of muscle tissue , olive oil, water, spices, and NaCl-soluble myofibrillar proteins(myosin and actomyosin), that are held together by a variety of attractive forces. Said proteins are of critical importance as the major structural components which form, in our case, an interfacial protein film around the finely dispersed oil globules (emulsion theory).

According to the emulsion-theory, in the uncooked product, myofibrillar proteins are attracted to and concentrated on the olive oil particle surface, forming a stabilizing membrane. In my method I take advantage of the localized frictional forces, during the comminution process, which help the formation of a thin protein layer on the surface of the olive oil globules to which undenaturated myosin is adsorbed. Thus, the “heavy meromyosin head faces the hydrophobic phase and the “ light meromyosin tail “ the aqueous phase.

As an overall result, a monomolecular layer of the undenaturated myosin around the (liquid) oil globules is established. In the uncooked product protein-protein interactions lead to the binding of other proteins to the myosin monolayer. Said protein interactions are in my invention supported by a blend of milk proteins (caseinates) and vegetable proteins. These interactions enhance the stability of the uncooked meat matrix and also the stability of the heat treated final product, as a result of a good heat set protein system, where olive oil is “captured.” I strongly believe that the incorporation of olive oil is guaranteed by both the emulsifying properties of myosin and actomyosin and their water holding capacity and to a lesser extent by the emulsifying properties of the added proteins (caseinates and vegetable proteins).

In contrast to my invention, Dubanchet's method is based on a totally different concept. Olive oil is, as a first step, vigorously homogenized and heated at elevated temperature in a blend of milk proteins, resulting in its entrapment in an intermediate product, which in a second step acts as the oil carrier. This intermediate product, in the form of small solid cubes (particles) is being transferred via mixing into the meat matrix.

I consider the present invention and the Dubanchet methods as two totally different methods, both from a technological as well as from a scientific point of view. Table 1 describes the essential differences as well as the advantages of the present invention method of incorporating olive oil in meat products over that of Dubanchet.

Table 1

Important attributes	Present Invention	Dubanchet
Emulsion preparation	In one step	In two steps
Thermal stressing of olive oil	<ol style="list-style-type: none"> 1. during emulsification: maximum temperature 4°C 2. thermal processing step: core temperature 71 °C 	<ol style="list-style-type: none"> 1. during emulsification: temperature above 100 °C 2. thermal processing step (traditional way): core temperature up to 75 °C
Mechanical stressing of olive oil	Mixing the olive oil in the batter	Homogenization of olive oil using turbo mill machine (greater friction effect).
Incorporation of olive oil	Direct incorporation of liquid olive oil in the batter at low temperature	Hot emulsification of olive oil with hot water and milk proteins to a solid mass
Aim of the invention	Stable incorporation of the liquid olive oil into the meat batter	Transformation of the liquid olive oil into a solid mass

Table 2 is a resume of my experimental results concerning (free fatty acids- FFA), peroxide value (POV), rancidity level (TBA) and antioxidative compounds (tocopherols).

As can be clearly deduced from column 4, the method of the present invention is superior

in all attributes. Specifically, peroxides develop in Dubanchet in a concentration almost 7 times the value of the present invention and rancidity level (TBA –test) at three times the value of the present invention, while 18,2% more tocopherols are retained into my product, which is the same as that of olive oil (181,6 in the present invention as compared to 182ppm in olive oil).

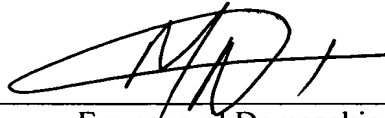
Table 2

Parameter (1)	Present Invention method (2)	Dubanchet method (3)	CF/D Ratio (4)
POV (meq O ₂ /Kg)	6,5	44,6	1: 6,8
TBA	0,05	0,16	1: 3,2
TOCOPHEROLS (ppm)	181,6	148,6	+ 18,2%

In conclusion, I believe that my way of olive oil incorporation and stabilization of the system from oil syneresis is novel and more effective.

I apologize for the grammatical and syntactical errors in the translation of the Greek priority document text into English. Please find filed herewith a, hopefully, acceptable revision of the text of my patent application, without the introduction of new matter.

I further declare under penalty of perjury pursuant to the laws of the United States of America that the foregoing is true and correct, and that this Declaration was executed by me on 7.7.2005 at Athens-Krioneri.
(date) (place)



Emmanouil Domazakis

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